IN THE CLAIMS

Please amend the claims to read as follows:

Listing of Claims

Claims 1-16 (Canceled).

17. (New) A method for decoding in a decoder at least one codeword, wherein the at least one codeword has been generated by an encoder comprising a structure providing a code representable by a set of branch transitions in a trellis diagram, the method comprising:

a)   initializing a set of branch transition probabilities in the decoder based on the received codeword and the encoder structure;

b)   initializing a first probability distribution and a second probability distribution according to the initial state of the encoder used to encode the at least one codeword;

c)   recalculating the values of the first probability distribution based on the initial values of the first probability distribution and the set of branch transition probabilities using a recursive algorithm;

d)   recalculating the values of the second probability distribution based on the initial values of the second probability distribution and the set of branch transition probabilities using a recursive algorithm; and

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e)   reconstructing a decoded codeword based on the received codeword and an extrinsic probability measure calculated based on the set of branch transition probabilities, the first and the second probability distribution;

wherein in either each of or both steps c) and d) a subset of initial values of the first probability distribution or the second probability distribution, respectively, and a subset of the set of branch transition probabilities is used for recalculating the respective probability distribution, and wherein the values in the subsets fulfill a predetermined reliability criterion.

18. (New) The method according to claim 17, wherein the encoder is representable by a shift register structure containing at least one of feed-forward mathematic operations and feed-back mathematic operations.

19. (New) The method according to claim 17, wherein the code is suitable for decoding by employing a maximum a-posteriori algorithm.

20. (New) The method according to claims 17, by further comprising using an intrinsic probability measure to initialize the set of branch transition probabilities in step a).

21. (New) The method according to claim 17, further comprising using an intrinsic probability measure to reconstruct the decoded codeword in step e).

22. (New) The method according to claim 20, wherein a decoder representable by two separate decoder instances is used for decoding the at least one codeword in a first decoding step and

the method further comprises using the extrinsic probability measure of the first decoder instance as the intrinsic probability measure in the second decoder instance.

23. (New) The method according to claim 22, further comprising performing a second decoding iteration comprising steps a) to e) in the first decoder instance, and

wherein the first decoder instance uses the extrinsic probability measure of the second decoder instance as the intrinsic probability measure.

24. (New) The method according to claim 17, wherein the reliability criterion is based on at least one of channel estimations of a radio channel via which the at least one codeword has been received, the absolute values of the elements of the first and/or second probability distribution, the number of decoding steps performed and a random process.

25. (New) The method according to claim 24, wherein the reliability criterion is not fulfilled by an element of the first or the second probability distribution, if the signal to noise ratio for the element and/or the absolute value of the element is below a predetermined threshold value.

26. A decoder for decoding at least one codeword, wherein the at least one codeword has been generated by an encoder comprising a structure providing a code representable by a set of branch transitions in a trellis diagram, the decoder comprising processing unit configured to:

a)   initialize a set of branch transition probabilities in the decoder based on the received codeword and the encoder structure;

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b) initialize a first probability distribution and a second probability distribution according to the initial state of the encoder used to encode the at least one codeword;

c) recalculate the values of the first probability distribution based on the initial values of the first probability distribution and the set of branch transition probabilities using a recursive algorithm;

d) recalculate the values of the second probability distribution based on the initial values of the second probability distribution and the set of branch transition probabilities using a recursive algorithm; and

e) reconstruct a decoded codeword based on the received codeword and an extrinsic probability measure calculated based on the set of branch transition probabilities, the first and the second probability distribution;

wherein the processing unit is configured to use in either each of or both steps c) and d) a subset of initial values of the first probability distribution or the second probability distribution, respectively, and a subset of the set of branch transition probabilities for recalculating the respective probability distribution, and

wherein the values in the subsets fulfill a predetermined reliability criterion.

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27. (New) A mobile terminal in a mobile communication system, comprising:

receiving unit configured to receive at least one codeword, demodulation unit configured to demodulate the at least one received codeword, and

a decoder according to claim 26.

28. (New) The mobile terminal according to claim 27, further comprising an encoding unit configured to encode data in at least one codeword, and a transmission unit configured to transmit the at least one codeword, and wherein at least one transmitted codeword is suitable for decoding according to a method wherein the at least one transmitted codeword has been generated by an encoder comprising a structure providing a code representable by a set of branch transitions in a trellis diagram, the method comprising:

a)   initializing a set of branch transition probabilities in the decoder based on the received codeword and the encoder structure;

b)   initializing a first probability distribution and a second probability distribution according to the initial state of the encoder used to encode the at least one codeword;

c) recalculating the values of the first probability distribution based on the initial values of the first probability distribution and the set of branch transition probabilities using a recursive algorithm;

d) recalculating the values of the second probability distribution based on the initial values of the second probability distribution and the set of branch transition probabilities using a recursive algorithm; and

e) reconstructing a decoded codeword based on the received codeword and an extrinsic probability measure calculated based on the set of branch transition probabilities, the first and the second probability distribution;

wherein in either each of or both steps c) and d) a subset of initial values of the first probability distribution or the second probability distribution, respectively, and a subset of the set of branch transition probabilities is used for recalculating the respective probability distribution, and wherein the values in the subsets fulfill a predetermined reliability criterion.

29. (New) A base station in a mobile communication system, comprising:

receiving unit configured to receive at least one codeword,

demodulation unit configured to demodulate the at least one received codeword, and

a decoder according to claim 26.

30. (New) The base station terminal according to claim 29, further comprising an encoding unit configured to encode data in at least one codeword, and a transmission unit configured to transmit the at least one codeword, and wherein at least one transmitted codeword is suitable for decoding according to a method wherein the at least one transmitted codeword has been generated by an encoder comprising a structure providing a code representable by a set of branch transitions in a trellis diagram, the method comprising:

a)   initializing a set of branch transition probabilities in the decoder based on the received codeword and the encoder structure;

b)   initializing a first probability distribution and a second probability distribution according to the initial state of the encoder used to encode the at least one codeword;

c)   recalculating the values of the first probability distribution based on the initial values of the first probability distribution and the set of branch transition probabilities using a recursive algorithm;

d)   recalculating the values of the second probability distribution based on the initial values of the second probability distribution and the set of branch transition probabilities using a recursive algorithm; and

e)   reconstructing a decoded codeword based on the received codeword and an extrinsic probability measure calculated based on the set of branch transition probabilities, the first and the second probability distribution;

wherein in either each of or both steps c) and d) a subset of initial values of the first probability distribution or the second probability distribution, respectively, and a subset of the set of branch transition probabilities is used for recalculating the respective probability distribution, and wherein the values in the subsets fulfill a predetermined reliability criterion.

31. (New) A mobile communication system comprising at least one base station according to claim 29 and at least one mobile terminal communication system comprising:

a receiving unit configured to receive at least one codeword,

a demodulation unit configured to demodulate the at least one received codeword, and

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a decoder configured to decode at least one codeword, wherein the at least one codeword has been generated by an encoder comprising a structure providing a code representable by a set of branch transitions in a trellis diagram, the decoder comprising processing unit configured to:

a)   initialize a set of branch transition probabilities in the decoder based on the received codeword and the encoder structure;

b)   initialize a first probability distribution and a second probability distribution according to the initial state of the encoder used to encode the at least one codeword;

c)   recalculate the values of the first probability distribution based on the initial values of the first probability distribution and the set of branch transition probabilities using a recursive algorithm;

d)   recalculate the values of the second probability distribution based on the initial values of the second probability distribution and the set of branch transition probabilities using a recursive algorithm; and

e)   reconstruct a decoded codeword based on the received codeword and an extrinsic probability measure calculated based on the set of branch transition probabilities, the first and the second probability distribution;

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wherein the processing unit is configured to use in either each of or both steps c) and d) a subset of initial values of the first probability distribution or the second probability distribution, respectively, and a subset of the set of branch transition probabilities for recalculating the respective probability distribution, and

wherein the values in the subsets fulfill a predetermined reliability criterion.